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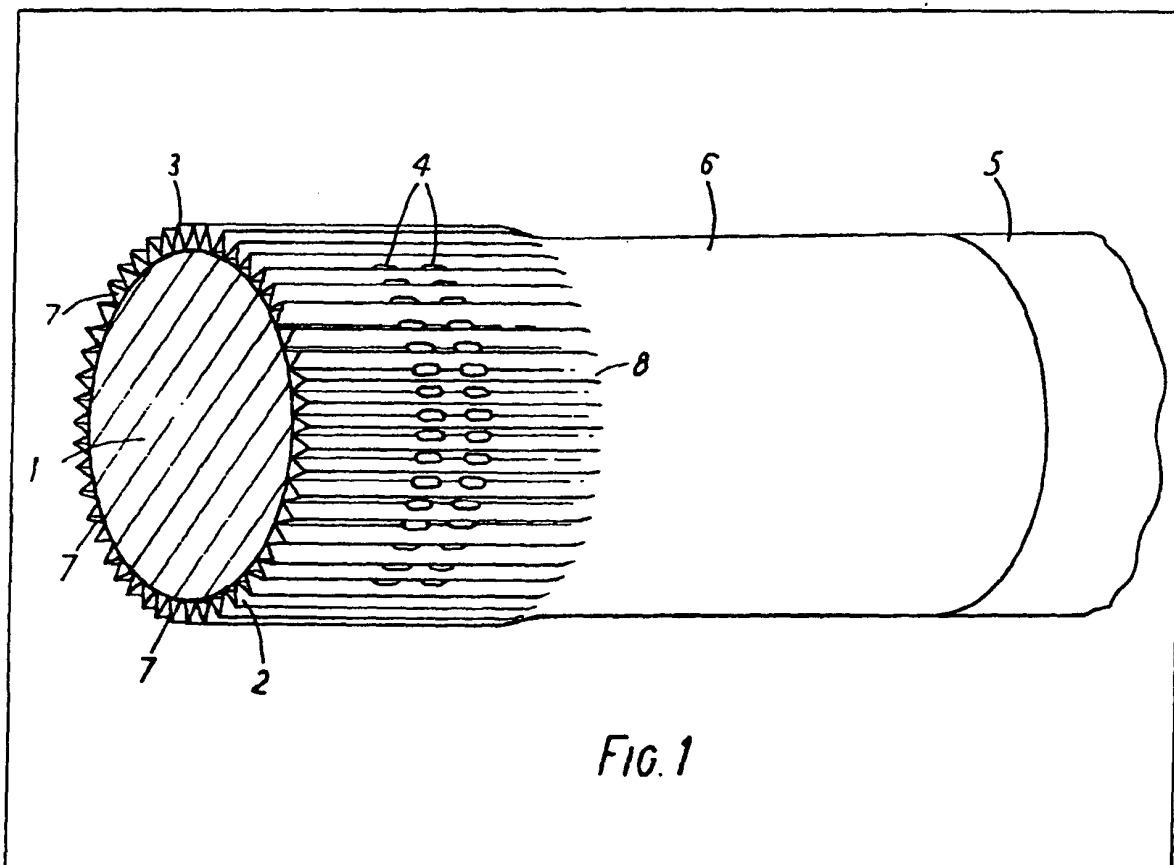
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(54) Ventilated and corrugated  
smoke filter

(57) A filtered cigarette has an exposed outer wrapping (6) which has corrugations (3) forming channels (7) open at the mouth end of the filter (1) and extending longitudinally of the filter, the exposed wrapper providing in use for the drawing of external air into said channels, e.g. via perforations (4), and directly into the smokers mouth. The exposed outer wrapper may constitute a tipping overwrap. The corrugations preferably extend only partially the length of the filter. There is also provided a corresponding filter per se, for attachment to a tobacco rod by ring tipping.



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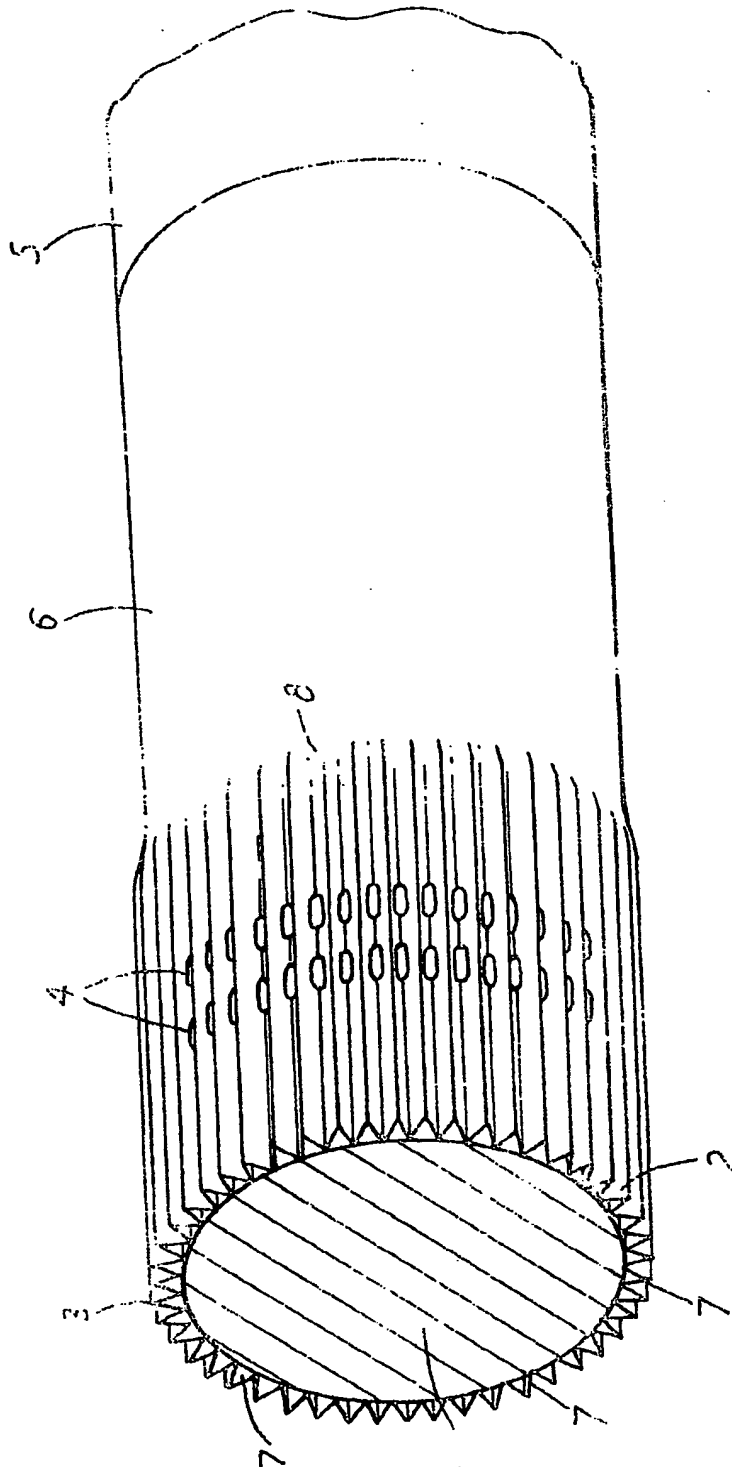


FIG. 1

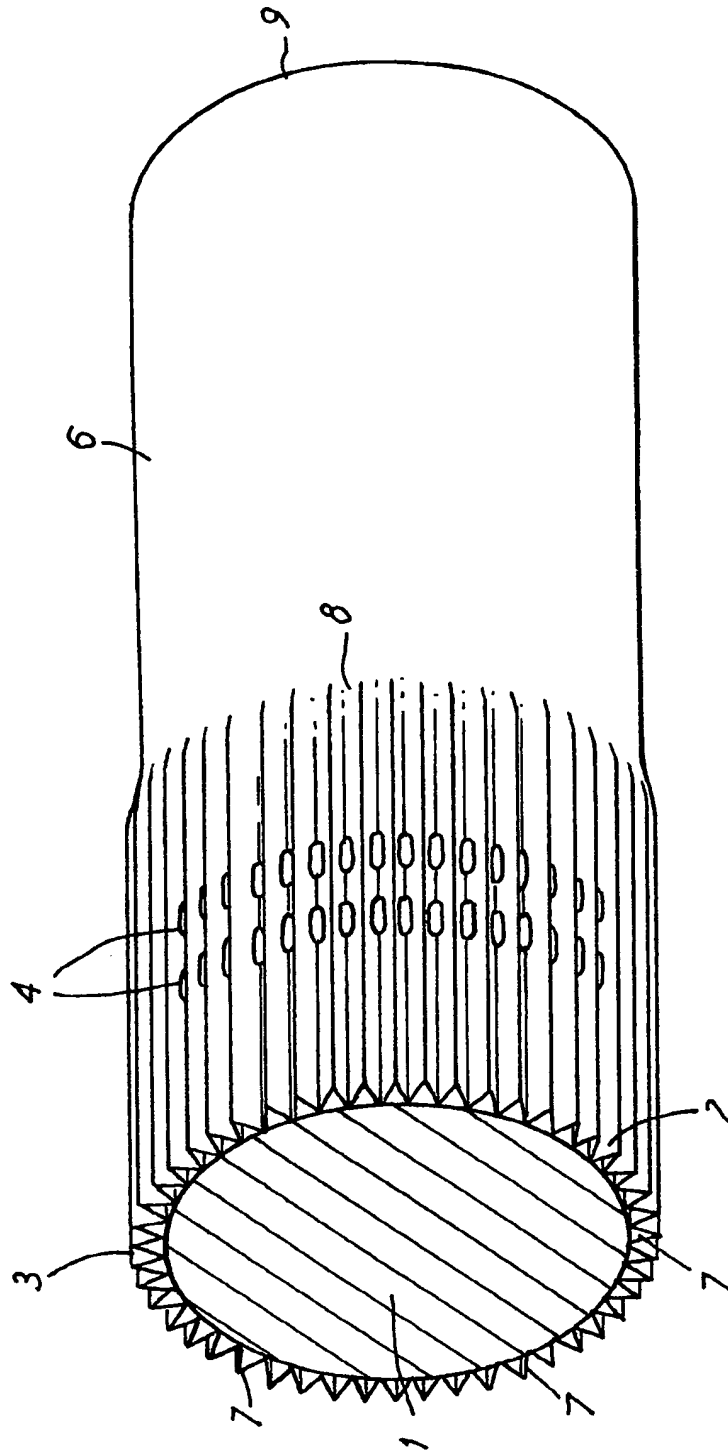


FIG. 2

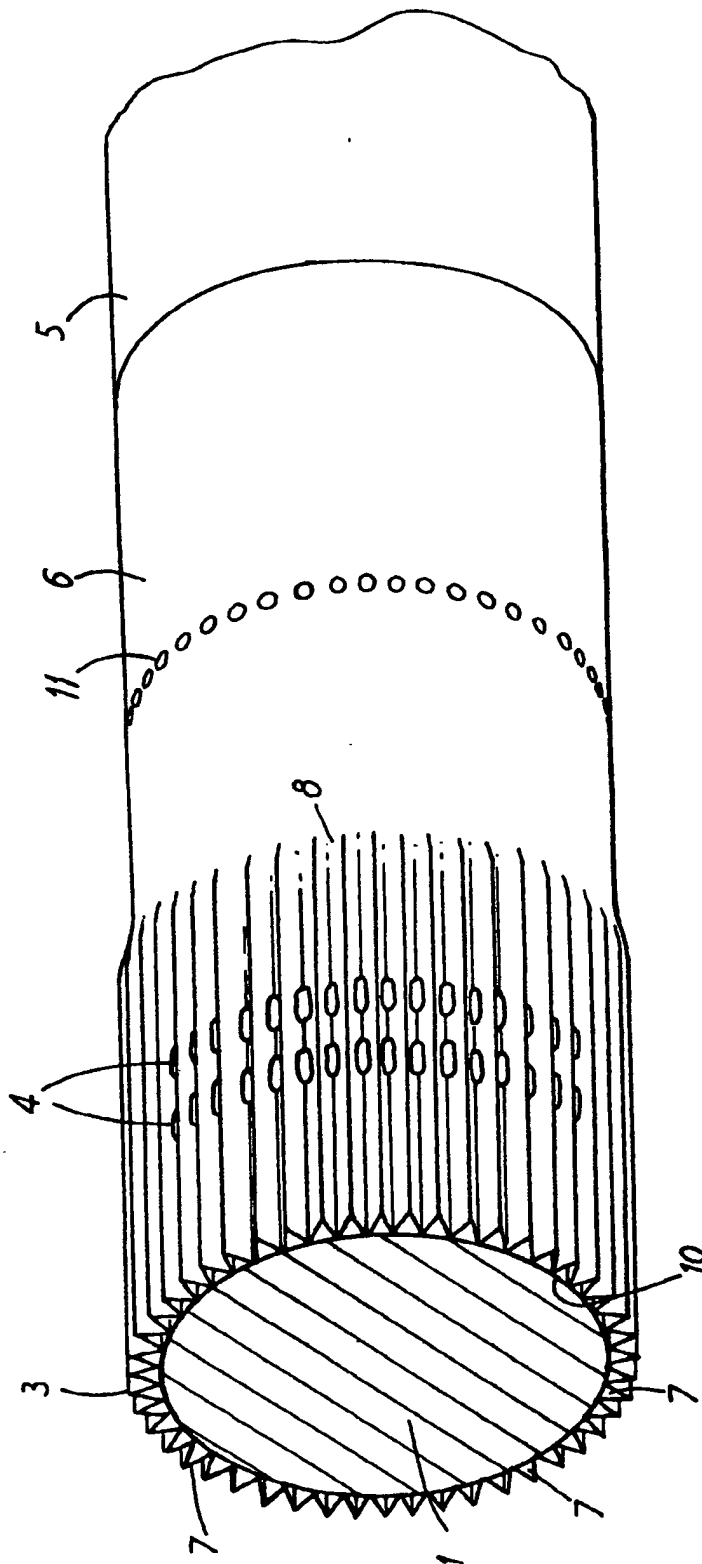


FIG. 3

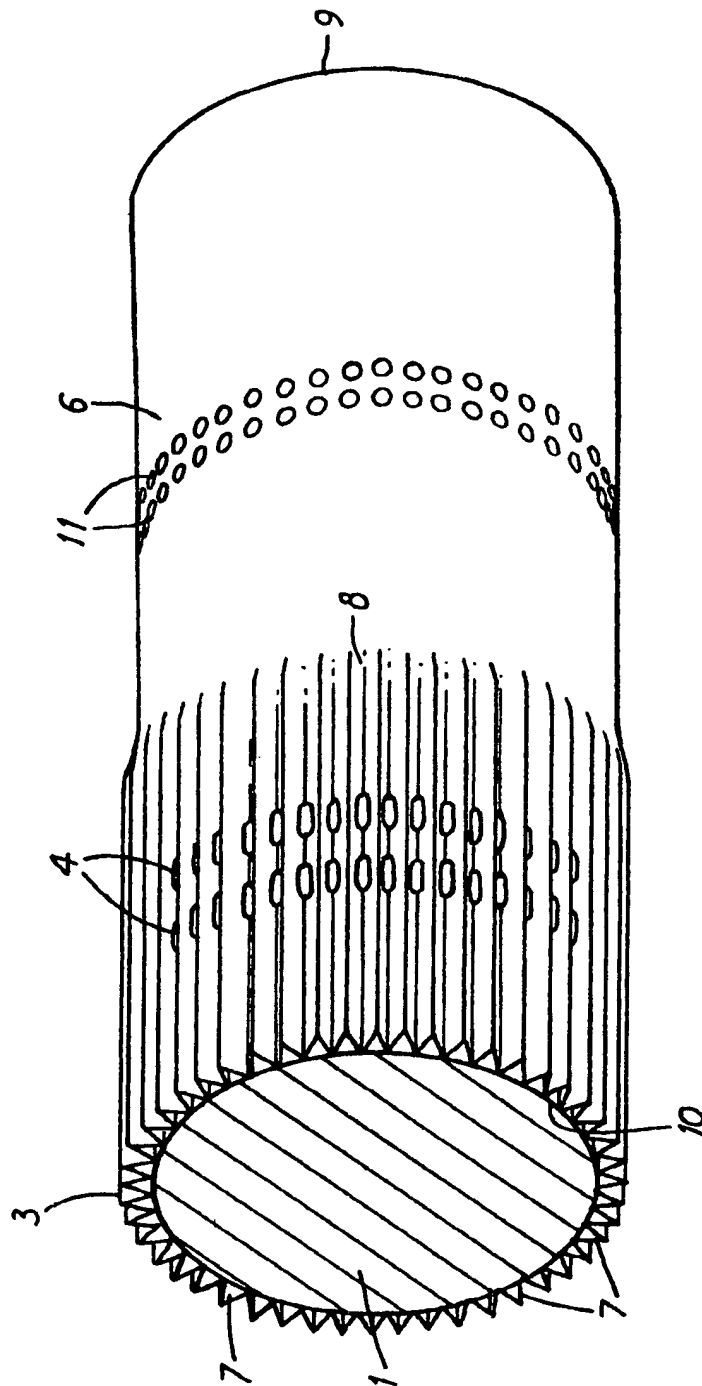


FIG. 4

## SPECIFICATION

## Smoke filter device

- 5 This invention relates to tobacco smoke filtering devices, and provides a filtered cigarette having an exposed outer wrapper which has corrugations forming channels open at the mouth end of the filter and extending longitudinally of the filter, the exposed wrapper providing in use for the drawing of external air into said channels and directly into the smokers mouth.

- 10 In some embodiments all of the air drawn into the channels may be constrained to pass directly into the smokers mouth; in others provision may be made for some of it to pass first into the filter; in either case separate provision may be made for additional external ventilating air to be drawn into the filter and/or into the tobacco rod.

- 15 The said exposed outer wrapper may be corrugated around the whole of the circumference, but it could equally have circumferentially alternating corrugate and plain regions—preferably symmetrically disposed. The corrugations will usually extend substantially axially of the filter, but this is not essential.

- 20 The said exposed outer wrapper may extend from the filter to surround at least the adjacent portion of the tobacco rod. In such cases it may be a tipping overwrap joining filter and tobacco rod together.

- 25 Where the said outer wrapper is such a tipping overwrap, it could be corrugated over the whole of its length with the channels being open at both ends; the corrugated wrapper, for example adhered to the underlying filter and tobacco rods along the under surface of one or more corrugation troughs, could be of substantially air-impermeable material—e.g. conventional tipping overwrap or cork tipping material. Preferably, however, the corrugations in the outer wrapper extend only partially from the mouth end of the filter towards the tobacco rod, the portion of the outer wrapper around the abutting ends of filter and tobacco rods conforming to the outer surfaces of the rods. In these cases, with the channels being closed at their upstream end, the outer wrapper could be of substantially air-impermeable material provided with perforations for admitting external air into the channels, or it might be of air-impermeable material with or without such perforations.

- 30 Modified arrangements are possible, employing a plain tipping overwrap joining the filter and tobacco rods with an exposed outer corrugated wrapper of any of the above types being secured thereto to provide the air channels; or employing ring tipping to join filter portion and tobacco rod, with an exposed outer corrugated wrapper of any of the above types secured around the assembly to

provide the air channels; indeed in such modifications the said exposed outer wrapper may extend only to or short of the beginning of the tobacco rod.

- 70 In embodiments where the said exposed outer corrugated wrapper does not extend beyond the filter portion to surround any of the tobacco rod, it preferably has its corrugations extending only part of its length from the mouth end of the filter rod, the filter at its other end being plain and attached to the tobacco rod by ring tipping. Once again, the outer wrapper can then be of substantially air-impermeable material with perforations through its corrugated portion for the passage of air into the channels, or it might be of air-permeable material with or without such perforations. The outer corrugated wrapper in all of these cases is preferably coextensive with the remainder of the filter being itself surrounded at its upstream end by the ring tipping.

- 80 The invention accordingly also provides a cigarette filter per se, the filter comprising a tobacco smoke filter rod having secured therearound an exposed outer wrapper which has corrugations forming channels open at a mouth end of the filter rod and extending therefrom only partially towards the other end of the filter rod which is attachable to a tobacco rod by ring tipping, the exposed wrapper providing in use for the drawing of external air into said channels and out of their open ends at the mouth end of the filter rod.
- 90 In some embodiments all of the air drawn into the channels may be constrained to pass directly out of said filter mouth end; in others provision may be made for some of it to pass first into the filter; in either case separate provision may be made for additional external ventilating air to be drawn into the filter.

- 95 Air drawn into a said channel of a filter or filtered cigarette according to the invention is constrained to pass directly into the smokers mouth when the wall of that channel provided by the underlying filter portion is air-impermeable. Such an air-impermeable wall may be provided individually for one, some, or each of said channels but usually all of the channels are alike in this respect, and this is conveniently achieved by providing the filter portion, at least over the length of the channels, with an air-impermeable wrapper or skin which is surrounded by the outer corrugated wrapper. It is preferred to employ for this purpose an air-impermeable wrapper which is a separate component rather than an integral air-impermeable skin on the filter rod, and such air-impermeable wrapper could for example be of plastics sheet material or of conventional air-impermeable plug wrap.

- 100 When, in contrast, the filter portion beneath the channels has no air-impermeable skin or inner wrapper, then between puffs smoke from the filter may enter the channels and

likewise some of the external air drawn into the channels may pass into the filter before entering the smokers mouth. In these cases, the filter portion may have no wrapper (apart from the exposed outer corrugated wrapper) or may be provided with an inner wrapper which is perforate and/or of inherently air-permeable material.

In all cases provision may be made for the ingress of additional external air other than by way of the channels, e.g. by way of air-permeable (e.g. perforate) portions of the outer corrugated wrapper where it is not corrugated—between and/or upstream of the corrugations.

In all embodiments the filter rod can be of unitary or composite multiple construction and can be of any of a variety of conventional smoke filtering materials.

The invention is illustrated, by way of example only, in the accompanying drawings, in which:—

Figures 1 and 3 are perspective views illustrating schematically two respective different filtered cigarettes according to the invention, and

Figures 2 and 4 are similar views of two respective different cigarette filters according to the invention.

In the Figures, like reference numerals denote like parts.

The filtered cigarette illustrated in Fig. 1 comprises a smoke filter rod 1 wrapped throughout its length in air-impermeable plug wrap paper 2 which is secured around the rod by a lapped and stuck seam (not shown). Rod 1 is suitably of bonded cellulose acetate tow, or might for example be a composite of a plug of such material abutting end to end with a plug of gathered creped paper. Rod 1 with wrapper 2 is joined end to end with a wrapped tobacco rod 5 by means of a tipping overwrap 6 of air-impermeable material which is provided around its mouth end with corrugations 3. These corrugations define with inner wrapper 2 channels 7 which extend from the mouth end longitudinally of the filter to terminate at 8 where the corrugations cease. Rings of perforations 4 around the corrugated portion of overwrap 6 result, when the filtered cigarette is drawn on in use, in the passage of external air into and along channels 7 and into the smokers mouth for admixture with smoke drawn through the filter rod 1.

In modifications of this embodiment, the wrapper 2 may be of air-impermeable plugwrap and/or provided circumferentially with perforations, so that a controlled amount of the ventilating air entering channels 7 through perforations 4 is drawn into filter 1 and admixes there with the smoke before entering the smokers mouth.

Whatever the nature of wrapper 2, wrapper 3 might instead be of inherently air-permeable material, in which case perforations 4 might

be dispensed with.

The filter illustrated in Fig. 2 is essentially the same, except that outer wrapper 6 is not a tipping overwrap but terminates at the upstream end 9 of rod 1. The resulting filter is designed for attachment at 9 to a wrapped tobacco rod by means of a conventional ring tipping (not shown). The variations mentioned above in respect of Fig. 1 apply also to Fig. 2. Figs. 3 and 4 correspond respectively to Figs. 1 and 2 with the difference in each case that the rod 1 has no inner wrapper 2 but simply an unwrapped air-permeable surface 10. In the particular embodiments shown the outer wrapper 6 is in each case of air-impermeable material, and is provided upstream of corrugations 3 with circumferential perforations 11 via which additional ventilation air is drawn directly into filter 1 which is suitably a conventional rod of non-wrapped bonded cellulose acetate filaments. In modifications where wrapper 6 is of inherently air-permeable material, perforations 4 and 11 might be dispensed with.

## CLAIMS

1. A filtered cigarette having an exposed outer wrapper which has corrugations forming channels open at the mouth end of the filter and extending longitudinally of the filter, the exposed wrapper providing in use for the drawing of external air into said channels and directly into the smokers mouth.

2. A filtered cigarette according to claim 1 wherein the exposed corrugated outer wrapping constitutes a tipping overwrap extending the length of the filter and over the downstream end of the tobacco rod.

3. A filtered cigarette according to claim 1 or 2 wherein the said corrugations extend only partially the length of the filter.

4. A cigarette filter comprising a tobacco smoke filter rod having secured therearound an exposed outer wrapper which has corrugations forming channels open at a mouth end of the filter rod and extending therefrom only partially towards the other end of the filter rod which is attachable to a tobacco rod by ring tipping, the exposed wrapper providing in use for the drawing of external air into said channel and out of their open ends at the mouth end of the filter rod.

5. A filtered cigarette comprising a filter according to claim 4 attached at the said other end of the filter rod to a tobacco rod by ring tipping.

6. A cigarette filter or filtered cigarette according to any preceding claim in which all of the air drawn into the channels is constrained to exit through their open ends at the mouth end.

7. A cigarette filter or filtered cigarette according to any of claims 1 to 5 wherein provision is made for some of the air drawn into the channels to pass into the filter.

8. A cigarette filter or filtered cigarette according to claim 6 or 7 wherein provision is made for additional external ventilating air to be drawn into the filter and/or into the tobacco rod.
- 5 9. A cigarette filter or filtered cigarette according to any preceding claim wherein the said exposed outer wrapper is corrugated around the whole of the filter circumference.
- 10 10. A filtered cigarette substantially as hereinbefore described with reference to Fig. 1 or Fig. 3 of the accompanying drawings.
- 15 11. A cigarette filter substantially as hereinbefore described with reference to Fig. 2 or Fig. 4 of the accompanying drawings.

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